National Aeronautics and Space Administration
Goddard Space Flight Center

Inside Wallops

Wallops Flight Facility, Wallops Island, Virginia | Volume XIX-99 | Number 42 | November 1, 1999

NASA Tests Design Concept for a New Pumpkin-Shaped Balloon

High flying balloons carrying science experiments for up to 100 days are closer to becoming reality early in the next century thanks to advanced materials and a new design by researchers led by the NASA Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, VA.

A test flight was successfully conducted recently from Ft. Sumner, N.M. of a pumpkin-shaped balloon half the size of a football field and approximately one-tenth the volume of what NASA calls its Ultra Long Duration Balloon (ULDB).

When fully inflated, the two million cubic foot prototype was 105 feet (32 meters) tall with a diameter of 174 feet (53 meters) and achieved the expected altitude of 86,000 feet (26 kilometers).

Artist's concept of the Ultra Long Duration Balloon

The full-scale ULDB will be more than twice the size of the prototype. Even more impressive than its size is the new balloon's staying power. The ULDB will stay aloft at altitudes of up to 115,000 feet (35 kilometers) for as long as 100 days with more than a ton of scientific instruments.

"Through enhanced computer technology, high-tech materials and advanced designs, we hope to revolutionize the size, shape, durability and stamina of the present long duration scientific balloon and open a new frontier for high-altitude research," said Harvey Needleman, Chief of the Balloon Program Office at Wallops. "The recent test launch, Oct. 23, 1999, provided valuable information in the development phase of the ULDB." NASA plans to fly the Ultra Long Duration Balloon in 2001.

NASA presently flies conventional and long duration scientific balloons gathering data from the uppermost region of Earth's atmosphere. A conventional balloon flight will last from one to two days while a long duration balloon flight will last up to three weeks. Researchers today are focusing on obtaining even more data during longer flights using an Ultra Long Duration Balloon.

"Flights of a significant duration require balloons to fly in the most extreme environmental conditions over oceans, deserts and even the polar ice cap. NASA's new ULDB will be designed for longer flights above 99 percent of the Earth's atmosphere. The material used to make them must be strong and adaptable," said Steve Smith, NASA's ULDB project manager.

An article on the ULDB, co-authored by Smith and James A. Cutts, of the Jet Propulsion Laboratory in Pasadena, Calif., is featured in the November issue of "Scientific American".

According to Smith, the ULDB will be made from a new material composite and will be a pumpkin-shaped structure rather than the spherical design of most other super pressure balloons. The new material consists of three bonded layers, a polyester fabric provides strength, a polyester film prevents helium molecules from leaking out and a polyethylene film contains the gas and provides added toughness. The material has increased strength and the ability to withstand damage by ultraviolet rays, while the pumpkin shape reduces material strength requirements and stress on the balloon.

Today's scientific balloons are usually one of two types, zero pressure or super pressure.

Like the zero pressure balloon, the super pressure balloon will be partially inflated when it leaves the ground. Unlike the zero pressure balloon, which has venting ducts in the bottom, the super pressure ULDB will be inflated and then completely sealed. This is possible because the ULDB will be made of a highly durable fabric that can withstand high internal pressures caused by solar heating and will not react to atmospheric influences allowing the ULDB to maintain lift, size and shape. Maintaining helium at a constant volume and density also will make the ULDB an extremely stable platform for scientific research.

For more information on NASA's Scientific Balloon Program visit NASA Wallops Flight Facility homepage at: http://www.wff.nasa.gov or the Balloon Program website at: http://www.wff.nasa.gov/pages/scientificballoons.html

NASA Team Member

Some time ago, I reaffirmed safety and health as NASA's highest core values and emphasized the importance of every NASA employee's involvement in and support of the Agency Safety Initiative. In the coming year, I plan to regularly discuss health and safety topics with the NASA team and place these topics on the NASA web site (www.nasa.gov/bios/goldin_speeches.html) and in e-mail to every NASA employee.

I strongly believe that promoting and maintaining our health is a prerequisite to ensuring safety and productivity in the unique NASA work environments on the ground, in the air and in space.

Studies show that the U.S. work force could be more productive if some of the common risk factors that cause errors and accidents were addressed.These risk factors, including stress at home and work, fatigue due to shift work, travel, and lack of sleep, unhealthy diet and insufficient exercise all contribute to errors and injuries. Through preventive measures such as health education, medical screening for early detection of chronic diseases and attention to safety we can minimize these risk factors - and more importantly, we can work more safely and productively.

I encourage every NASA employee to review the information that I will be forwarding and to take full advantage of our NASA-wide expansion of occupational health services. This is an investment for everyone on the NASA team and an investment in NASA's future. Our preeminence in air and space is a result of your hard work and expertise, and good health and safety are keys to that success. To maintain our competitive edge we must do more than talk about our concerns for health and safety. Ultimately, it is up to each of us to accept responsibility for our personal health and safety. That means everywhere, at all times, at work and at home. And if we pursue this goal as a team, we can protect our most valuable asset - you.

Daniel S. Goldin
Administrator

Events at the Visitor Center During November

November 6: "Model Rocket Launch"

A model rocket launch will be held at 1 p.m. Models of various rockets will be launched. Model rocketeers are invited to bring their own rockets and launch them. The launch will be canceled if it is raining or winds exceed 18 mph.

November 20: "Bottle Rockets"

Children of all ages interested in learning how to make and fly a bottle rocket are requested to bring an empty 2-liter plastic soda bottle to this program which begins at 1 p.m. The program will be cancelled if it is raining.

November 27: "Stars-in-the-Sky"

Children will create star posters and learn how to recognize some of the better-known constellations during a "Stars-in-the-Sky" program that begins at 1 p.m.. Parents are encouraged to attend this 30-minute "hands-on" program. No reservations are necessary and all materials are provided by the NASA Visitor Center.

Daily: "Space Ace"

Children ages 5-10 years can earn a "Space Ace" certificate and a lithograph during their Visitor Center experience by completing an activity sheet.

Saturdays and Sundays

"Puppets in Space", a 10-minute puppet show, will be presented at 11 a.m. on Saturdays and Sundays. Puppet astronauts and Sam the monkey will explore space flight, including the space suit. An eight-minute version of the film "Astrosmiles" follows the puppet show.

Sundays: "Humans in Space"

"Humans in Space" is the subject of a 1 p.m. program for children of all ages. The 30-minute program looks at living and working in space, including a review of the astronauts' culinary delights and their wardrobe. The program is followed by a hands-on children's activity during which children have the opportunity to create their own "space helmet."

The Visitor Center is open Thursday through Monday from 10 a.m. to 4 p.m. and is closed on Tuesday and Wednesday. The Visitor Center will be closed Thursday, November 11 for Veteran's Day and Thursday, November 25 for the Thanksgiving holiday. For further information, call x2298.

Barrier Island Center Holds Open House

The Barrier Island Center held an open house, Oct. 31, at what will become a new museum (above) housing artifacts that were a part of barrier island life. NASA's "100 Years on Wallops Island" display was featured along with decoys, Life Saving Service memorabilia, tools and other items that provide an insight into what life was like for our island ancestors.

There once was a village of 250 people on Hog Island and other islands such as Cobb and Wallops were home to nationally known resorts and sportsmen's hotels. Those days are gone. All that remains are the memories and with each passing year, we lose more of the people whose lives were tied to the islands.

The goal of the Barrier Island Center is to preserve the history and culture associated with this unique way of life. They are working with the Eastern Shore of Virginia Historical Society to collect items and to arrange public exhibitions to foster an awareness and appreciation for this vital aspect of Virginia history.

The Barrier Island Center, although not yet open on a regular basis, is located near Machipongo on Lankford Highway. For further information or to donate artifacts contact The Barrier Island Center, P. O. Box R, Melfa, VA 23410 or call (757) 787-2460.

In keeping with Halloween, Wallops employees donated a total of 30 pints of blood, not to ghouls or goblins, but to a technician from the American Red Cross.

All Wallops employees are invited to a Morning Coffee Nov. 17 8 to 9 a.m. Cafeteria

Leadership and Strategy Satellite Series

Thinking Systemically about Leadership and Change

Peter Senge - Presenter
Wallops TV Channel 6
Nov. 10
11 a.m. to 12:30 p.m.

Peter Senge is the author of the best selling book, The Fifth Discipline and co-author of The Fifth Discipline Fieldbook. Over 650,000 copies of The Fifth Discipline have been sold, and it was selected by the Harvard Business Review as one of the seminal management books of the past 75 years. Peter is a senior lecturer at the Sloan School at Massachusetts Institute of Technology and the chairman of the Society of Organizational Learning.

To receive the 47-page handout, e-mail: *Sherry.W.Kleckner.1@gsfc.nasa.gov* or call x1204.

Attention Deficit Disorder What's it all about?

When: Nov. 3, 1999
9 a.m.
Where: Bldg. F-160, Room C164

Have you ever found it difficult to maintain focus or concentration? Do you have a tendency to start projects and not complete them? Do have difficulty returning to your work once you've been interrupted? These patterns may just be part of your personality or an indication of something more. Join our discussion to learn more. Led by Dr. Chris Garner, an Employee Assistance Program affiliate counselor, this workshop will last approximately one hour.

For information call the EAP, x66-4600.

Inside Wallops is an official publication of Goddard Space Flight Center and is published by the Wallops Office of Public Affairs, Extension 1584, in the interest of Wallops employees.

Editor — Betty Flowers
Photography — Optical Section
Printing — Printing Management Office